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# A new species of *Grammothelopsis (Polyporales, Basidiomycota)* from southern China

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Abstract — A new polypore, *Grammothelopsis subtropica*, is described and illustrated based on three specimens collected in Guangdong and Hunan provinces, southern China. Macroscopically, the new species is characterized by an annual growth habit, resupinate basidiocarps with cream pore surface, and large pores (1–2 per mm); microscopically, it has a dimitic hyphal system with strongly dextrinoid and cyanophilous skeletal hyphae, and its basidiospores are ellipsoid to oblong-ellipsoid, thick-walled, slightly dextrinoid, slightly cyanophilous, and 12.7–15.2 × 4.9–5.9 μm. In addition, dendrohyphidia are abundant in dissepiments. An identification key to the worldwide species of *Grammothelopsis* is provided.

Key words — lignicolous and poroid fungi, *Polyporaceae*, taxonomy

## Introduction

*Grammothelopsis* Jülich was established by Jülich (1982) and typified by *G. macrospora* (Ryvarden) Jülich. It is characterized by resupinate to effused basidiocarps, shallow irregular pores, and large thick-walled variably dextrinoid basidiospores. *Grammothelopsis* species occur mostly in tropical Africa and America (Robledo & Ryvarden 2007, Ryvarden & de Meijer 2002), with one species recently described from tropical China (Dai et al. 2011).

As a result of recent surveys of the diversity of wood-inhabiting fungi in southern China, many new fungal species have been described from tropical and subtropical areas of the country (Cui & Dai 2008, 2011; Cui et al. 2009, 2010, 2011; Dai 2012a; Dai & Korhonen 2009; Dai et al. 2003, 2004, 2009, 2010, 2011; Du & Cui 2009; Jia & Cui 2011; Li & Cui 2010; Ma et al. 2011; Yuan 2011; Yuan & Dai 2008a,b; Zhang et al. 2012; Zhou & Dai 2012). However, the diversity and richness of tropical polypores in China are still not well known (Dai 2012b), and there are still many unidentified specimens from tropical China. During examination of southern Chinese polypore collections, an

additional undescribed *Grammothelopsis* species was found, which is described and illustrated in the present paper.

## Materials & methods

The studied specimens are deposited at the herbaria of the Institute of Microbiology, Beijing Forestry University (BJFC) and the Institute of Applied Ecology, Chinese Academy of Sciences (IFP). The microscopic routine used in the study follows Dai (2010). Sections were studied at magnifications up to ×1000 using a Nikon Eclipse E 80i microscope and phase contrast illumination. Drawings were made with the aid of a drawing tube. Microscopic features, measurements, and drawings were made from slide preparations stained with Cotton Blue and Melzer's reagent. Spores were measured from sections cut from the tubes. In presenting the spore size variation, the 5% of measurements excluded from each end of the range are given in parentheses. Abbreviations include: IKI = Melzer's reagent, KOH = 5% potassium hydroxide, CB = Cotton Blue, CB+ = cyanophilous, L = mean spore length (arithmetic average of all spores), W = mean spore width (arithmetic average of all spores), Q = variation in the L/W ratios between the specimens studied, n = number of spores measured from given number of specimens. Special color terms follow Petersen (1996).

## Taxonomy

***Grammothelopsis subtropica*** B.K. Cui & C.L. Zhao, **sp. nov.** Fig. 1

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Differs from other *Grammothelopsis* species by an annual growth habit, resupinate basidiocarps with creamy shallow large pores (1–2 per mm), ellipsoid to oblong ellipsoid, slightly dextrinoid and slightly cyanophilous basidiospores, presence of dendrohyphidia, and absence of hyphal pegs.

Type: China, Guangdong Province, Fengkai County, Heishiding Nature Reserve, on fallen angiosperm branch, 1.VII.2010, Cui 9035 (**holotype**, BJFC).

Etymology: *subtropica* (Lat.): refers to the species being distributed in the subtropics.

Fruitbody — Basidiocarps annual, resupinate, adnate, soft corky, without odor or taste when fresh, becoming corky upon drying, ≤ 7.5 cm long, 1.6 cm wide, 0.7 mm thick at center. Pore surface white to cream when fresh, cream upon drying; pores round to angular, 1–2 per mm; dissepiments thin, entire. Sterile margin narrow, white, ≤ 1 mm wide. Subiculum cream, thin, ca. 0.2 mm thick. Tubes concolorous with pore surface, corky, ≤ 0.5 mm long.

Hyphal structure — Hyphal system dimitic; generative hyphae with clamp connections; skeletal hyphae strongly dextrinoid in Melzer's reagent, CB+, tissues unchanged in KOH.

Subiculum — Generative hyphae infrequent, hyaline, thin-walled, 2.1–2.5 μm in diam; skeletal hyphae dominant, hyaline, thick-walled with a wide to narrow lumen, frequently branched, flexuous, interwoven, 2.3–2.8 μm in diam.

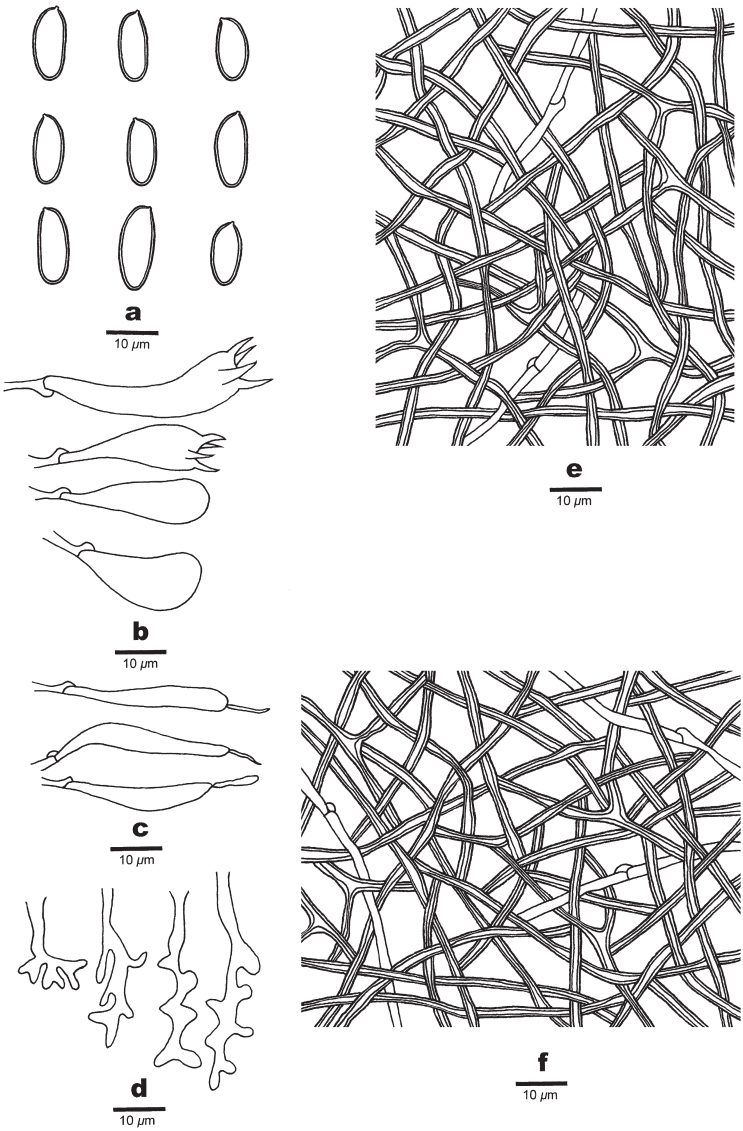


Figure 1. *Grammothelopsis subtropica* (holotype) microscopic structures.
a: Basidiospores. b: Basidia and basidioles. c: Cystidioles.
d: Dendrohyphidia. e: Hyphae from trama. f: Hyphae from subiculum.

Tubes — Generative hyphae infrequent, hyaline, thin-walled, 2–2.3 μm in diam; skeletal hyphae dominant, hyaline, thick-walled with a wide to narrow lumen, frequently branched, flexuous, interwoven, 2–2.5 μm in diam. Dendrohyphidia abundant in dissepiments, hyaline, thin-walled, ≤ 45 μm long. Cystidia absent, fusoid cystidioles present, hyaline, thin-walled, 28.1–36 × 4.2–6.4 μm; basidia clavate to pear-shaped, with four sterigmata and a basal clamp connection, 36.5–39.1 × 8.9–9.8 μm; basidioles dominant, mostly pear-shaped, slightly smaller than basidia.

Spores — Basidiospores ellipsoid to oblong-ellipsoid, hyaline, thick-walled, smooth, slightly dextrinoid in Melzer's reagent, weakly CB+, (11.2–)12.7–15.2(–16) × (4.7–)4.9–5.9(–6.1) μm, L = 13.7 μm, W = 5.3 μm, Q = 2.4–2.7 (n = 90/3).

Additional specimens examined: **China**. **Guangdong Province**, Fengkai County, Heishiding Nature Reserve, on fallen angiosperm branch, 1.VII.2010, Cui 9041 (BJFC); **Hunan Province**, Yizhang County, Mangshan Nature Reserve, on fallen angiosperm trunk, 24.VI.2007, Li 1662 (IFP).

## Discussion

Six species have been recorded in *Grammothelopsis*: *G. bambusicola* Ryvarden & de Meijer, *G. incrustata* A. David & Rajchenb., *G. neotropica* Robledo & Ryvarden, and *G. puiggarii* (Speg.) Rajchenb. & J.E. Wright were found in Central and South America (David & Rajchenberg 1985; Rajchenberg & Wright 1987; Robledo & Ryvarden 2007; Ryvarden & de Meijer 2002), *G. macrospora* in tropical Africa (Ryvarden & Johansen 1980), and *G. asiatica* Y.C. Dai & B.K. Cui in tropical China (Dai et al. 2011).

*Grammothelopsis bambusicola* has a dimitic hyphal system with strongly dextrinoid skeletal hyphae and presence of dendrohyphidia. However, it differs from *G. subtropica* in having smaller pores (4 per mm) and strongly dextrinoid, wider basidiospores (11–13.5 × 7.8–9 μm: measured from type specimen by Dai et al. 2011).

*Grammothelopsis macrospora* may be confused with *G. subtropica* due to its resupinate basidiocarps with larger pores (1–2 per mm) and presence of dendrohyphidia, but it is distinguished from *G. subtropica* by its non-dextrinoid and unbranched skeletal hyphae. In addition, its basidiospores are strongly dextrinoid and larger (15–20 × 7.5–11 μm: Robledo & Ryvarden 2007).

*Grammothelopsis incrustata* and *G. neotropica* also have resupinate basidiocarps and a dimitic hyphal system, but both species have smaller pores (3–4 per mm), non-dextrinoid skeletal hyphae, and distinctly larger basidiospores (*G. incrustata*, 16–22 × 6–8 μm; *G. neotropica*, 18–20 × 7–8 μm: Robledo & Ryvarden 2007).

*Grammothelopsis puiggarii* shares with *G. subtropica* larger pores (1–2 per mm) and a dimitic hyphal system with strongly dextrinoid skeletal hyphae, but

*G. puiggarii* has larger basidiospores (17–20 × 10–12 μm) and lacks dendrohyphidia (Robledo & Ryvarden 2007).

*Grammothelopsis asiatica* resembles *G. subtropica* in resupinate basidiocarps, a dimitic hyphal system, and similar basidiospores (10.5–13 × 5.4–6 μm). However, *G. asiatica* has smaller pores (3–4 per mm), its skeletal hyphae and basidiospores are non-dextrinoid, and it lacks dendrohyphidia (Dai et al. 2011).

### Key to the species of *Grammothelopsis*

1. Dendrohyphidia present ..... 2
1. Dendrohyphidia absent ..... 4

2. Pores 3–4 per mm ..... *G. bambusicola*
2. Pores 1–2 per mm ..... 3

3. Basidiospores >15 μm long, hyphal pegs present ..... *G. macrospora*
3. Basidiospores <15 μm long, hyphal pegs absent ..... *G. subtropica*

4. Generative hyphae simple septate ..... *G. incrustata*
4. Generative hyphae with clamp connections ..... 5

5. Pores 1–2 per mm, basidiospores strongly dextrinoid ..... *G. puiggarii*
5. Pores 3–4 per mm, basidiospores non-dextrinoid ..... 6

6. Basidiospores >15 μm long ..... *G. neotropica*
6. Basidiospores <15 μm long ..... *G. asiatica*

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